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SITE ASSESSMENT TECHNICAL ASSISTANCE

EPA CONTRACT 68-S5-3002

7-Jul-97

Mr. Kevin Koob (3HW31)  
On-Scene Coordinator  
U.S. EPA Region III  
841 Chestnut Building  
Philadelphia, PA 19107

TDD No. 9705-19  
DCN C0000410

Subject: Valley Forge National Historical Park Asbestos Site Extent of Contamination  
Study Plan

Dear Mr. Koob,

Enclosed is the Extent of Contamination Study Plan for the Valley Forge National Historical Park Asbestos Site located in Valley Forge, Montgomery County, Pennsylvania. If you have any questions regarding any aspect of this report, please feel free to contact me at (215) 238-0338, Ext. 234.

Sincerely,

ROY F. WESTON, INC.

(b) (4)



Attachment

SATA0301480\newvfnhpworkplan

Roy F. Weston, Inc.

**FEDERAL PROGRAMS DIVISION**

In Association with Foster Wheeler Environmental Corporation; Resource Applications, Inc.; C.C. Johnson & Malhotra, P.C.; and PRC Environmental Management, Inc.

# EXTENT OF CONTAMINATION STUDY PLAN

VALLEY FORGE NATIONAL HISTORICAL PARK ASBESTOS SITE  
VALLEY FORGE, MONTGOMERY CO., PENNSYLVANIA

TDD No.9705-19  
EPA Contract No. 68-S5-3002

## 1.0 INTRODUCTION

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The United States Environmental Protection Agency Region III (EPA) On-Scene Coordinator (OSC) Kevin Koob has directed the Roy F. Weston, Inc. Site Assessment Technical Assistance (SATA) team to prepare an extent of contamination study plan for the Valley Forge National Historical Park (VFNHP) Asbestos Site (Site).

## 2.0 BACKGROUND

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Between the years of approximately 1890 and 1965, an insulation manufacturer operated on a parcel of property which is now part of the VFNHP. This manufacturer utilized asbestos in its process, and disposed of waste materials in abandoned quarries through a slurry line and through direct dumping. According to available records, all dump areas were subsequently covered with soil. These quarries and dump areas are now part of the VFNHP.

In February 1997, a National Park Service (NPS) contractor installing a fiber optic cable through the amphitheater quarry on VFNHP property encountered suspected asbestos containing material (ACM). NPS representatives collected samples of the material and confirmed that the material was asbestos. NPS representatives began an investigation of VFNHP property and identified previous disposal areas with deteriorated cover, resulting in exposed ACM. Prior to EPA involvement in May 1997, the NPS collected a total of 30 samples of suspected ACM, all of which were positive for asbestos at levels of up to 70%. Both amosite and chrysotile type asbestos were identified on site. An estimated 14 acres of VFNHP property are affected.

In May 1997, EPA OSC Koob received an anonymous tip that exposed friable asbestos was present at VFNHP. On 20 May 1997, OSC Koob activated \$200,000 in CERCLA funding to initiate a Removal Action at the Site and mitigate the threat posed to human health, welfare, and the environment.

Between 20 May and 3 July 1997, the OSC coordinated a Removal Action which mitigated the immediate threat posed by the Site. This emergency mitigation included the following activities:

- isolate areas of exposed ACM as identified by the NPS utilizing high-visibility snow fencing
- maintain exposed asbestos in a wetted condition as per Agency for Toxic Substances and Disease Registry (ATSDR) recommendations until the area is capped
- conduct air sampling in work areas and in visitor traffic areas for airborne asbestos
- cap exposed ACM according to state requirements (six inches of vegetated soil or 12 inches of unvegetated soil)
- stabilize ACM utilizing liquid soil stabilizer in areas where soil capping is not appropriate

All of the above objectives were met for priority areas identified by the NPS during the Removal Action initiated by OSC Koob. As part of this action, OSC Koob directed SATA to prepare an extent of contamination study plan which would be implemented as part of a long term remediation at the Site. This plan is designed to meet that requirement.

### 3.0 IDENTIFICATION OF AREAS AND HEALTH AND SAFETY

Areas on-site which have been identified as containing suspect or confirmed ACM have been named by the OSC, NPS, ERCS RM, and SATA. These areas are identified according to geographical/landmark features and have been numbered (see site map). The major areas, along with their associated sub-areas, estimated size, current status, and potential short- and long-term solutions are identified in Appendices A and B.

The actions conducted for this extent of contamination study will adhere to the Site Health and Safety Plan protocol for the Removal Action. Levels of protection for each task are specified within that task as required. The levels of protection are defined in the Site Health and Safety Plan.

### 4.0 METHOD OF IMPLEMENTATION

This plan is designed to be implemented in a regimented, organized manner. With the exception of air sampling activities and soil sampling activities, this plan must be implemented in the order presented here to insure effectiveness. Essentially, this plan will be implemented with the following steps:

- conduct an intensive historical aerial photographic interpretation to determine areas utilized for dumping, or areas which appear anomalous.
- conduct an intensive field ground survey utilizing individuals who are familiar with the appearance of ACM at the site in order to identify areas of exposed suspected ACM
- collect samples of any exposed materials suspected to be ACM for asbestos analysis via Polarized Light Microscopy (PLM) analysis
- isolate areas of exposed suspected ACM utilizing banner guard
- conduct a subsurface investigation of areas identified as anomalous during the aerial photographic interpretation to a depth of 2 feet in order to determine the depth of soil cover in these areas
- initiate remediation as deemed appropriate for specific areas.

In addition to the above steps, soil sampling and air sampling will be conducted to determine the threat posed to NPS employees and the potential for and past extent of airborne migration of contaminants.

#### 4.1 Historical Aerial Photographical Interpretation

Currently, SATA has completed a rudimentary aerial photograph investigation which has included photographs from 1948 and 1950. In order to more accurately define the areas of concern at the Site, an in-depth aerial photographic interpretation will be performed by a qualified subcontractor. This interpretation will include all aerial photographs which are available for the area in question, and will cover the years of operation for the Keene Corporation (as early as possible) through 1997. This interpretation will include infrared photographs if available. If historical infrared photographs are not available for the area, an infrared flyover will be subcontracted and included in the interpretation.

Areas which are identified in the historical aerial photographic interpretation as anomalous will be overlaid onto the AutoCAD Site map created by SATA for preliminary evaluation. Any areas which are identified as "new" will be targeted for a field ground survey as described in Section 4.3 "Field Ground Survey". Areas which have already been identified by SATA have been thoroughly investigated, with the exceptions as noted in Section 5.0 "SATA Observations".

#### 4.2 Field Ground Survey

The field ground survey is a critical phase of this extent of contamination study. This survey must be conducted by persons who are familiar with the outward appearance of suspected ACM as it appears at the Site. During this phase of the

study, it is crucial that areas identified during the aerial photographic interpretation are accurately located, identified, and thoroughly investigated.

The field ground survey will be conducted in late fall, winter, or early spring in order to take advantage of the lack of vegetative cover during these times. The field survey will be conducted immediately following rain, if practicable, or when ground conditions are frozen in order to eliminate the threat of personnel exposure to friable asbestos. These conditions have been determined to be adequate by ATSDR to prevent friable asbestos from becoming airborne.

Areas identified as anomalous during the aerial photographic interpretation will be located and marked with a Global Positioning System (GPS) coordinate, if possible. The area will be investigated thoroughly by competent individuals, and any areas of exposed suspected ACM will be flagged with pin flags, sampled for asbestos analysis, and isolated using banner guard tape until receipt of the analytical results. During the interim, these areas will be maintained in a wetted condition in order to eliminate the threat of friable asbestos becoming airborne. If analytical results confirm the presence of asbestos, these areas will be remediated in accordance with Pennsylvania state regulations (6 inches of vegetated soil cover or 12 inches of unvegetated soil cover).

Any areas which have been identified as anomalous and which have been confirmed to contain asbestos at levels greater than 1% by volume (ACM as per 29 CFR 1926.1101) will be targeted for a subsurface investigation in order to determine the depth of soil cover present in these areas as described in Section 4.3 "Subsurface Investigations".

It is currently anticipated that the field ground survey will be conducted in level "D" personal protection unless conditions warrant an upgrade.

#### 4.3 Subsurface Investigations

All areas which have been confirmed to contain asbestos at levels greater than 1% by volume will be targeted for subsurface investigation. The purpose of this investigation is to determine the depth of soil cover on areas identified with asbestos contamination in order to meet Pennsylvania state regulations as well as to determine the threat of future exposure in these areas. In order to perform this investigation, a geoprobe or similar automated coring device should be utilized with a split-spoon attachment capable of retrieving a soil sample utilizing an acetate sleeve insert at depths of up to two feet. If the area does not lend itself to the use of such a device, then a manual split spoon or screw auger should be utilized for this function. Prior to the execution of sampling, the targeted area will be wetted generously with water. A sample will then be collected to a depth of two feet, at which time a qualified individual will record

the depth of soil cover in the area. If suspected ACM is not encountered, a record of "greater than 2 feet of soil cover" will be documented for the sample location. The retrieved sample will be replaced into its respective hole upon completion of activities at that site. Each sample location will be marked with a wooden stake and will be surveyed in relation to a known landmark for future reference. All sampling equipment will be decontaminated as specified in the Site Health and Safety Plan.

It is currently anticipated that very large areas will be surveyed utilizing a 200-foot grid system. Subsurface samples will be collected at the nodes of this grid system in order to obtain a representative overview of the area. In cases where the area does not lend itself to a 200-foot grid system, or in areas where such a grid system cannot be surveyed, sample locations will be collected every 200 feet linearly. For areas which are too small to be sampled in this fashion, field personnel will determine the number of samples to be collected based upon the terrain, vegetation, and size of the area. It is recommended that at least three samples be collected from each area in order to determine a representative soil cover for the area in question. Since the survey team will be conducting operations in areas that have been capped or stabilized, surveying will be conducted in level "D" personal protection unless conditions warrant otherwise.

Any areas identified with less than six inches of vegetated soil cover or less than 12 inches of unvegetated soil cover will be considered an immediate threat and will be remediated in accordance with PA state regulations. Areas identified with 6 to 12 inches of vegetated cover or 12 to 18 inches of unvegetated cover will be considered potential exposure threats and will be monitored via field survey yearly for any degradation in the cover. These areas will be considered for remediation on a case by case basis considering location, terrain, visitor traffic, and animal activity.

Any areas identified with greater than 12 inches of vegetated cover or greater than 18 inches of unvegetated cover will be monitored via ground survey on a bi-annual basis in order to determine degradation in soil cover. No remediation will be anticipated for these areas unless field surveys indicate a change in conditions.

It is anticipated that the subsurface investigations will be conducted in level "C" protection unless conditions warrant otherwise.

#### 4.4 Soil Sampling

Analytical methods for asbestos in soil are non-existent. It is anticipated that any soil samples collected at the Site will be analyzed for asbestos via PLM in order to determine a percent concentration by volume. Any soil samples

yielding results of 1% or greater of asbestos by volume will be considered as exposed asbestos areas (ACM as per 29 CFR 1926.1101).

Soil sampling will be conducted in areas where high visitor/employee traffic is in close proximity to confirmed areas of exposed asbestos. Soil sampling should focus on areas frequented by visitors and employees. These areas include:

- the drainage ditch along County Line Road
- the horse/foot trail from the Lower Visitors Center Parking lot to the Amphitheater
- the silicate bank areas along County Line Road
- the Grassy Knoll area along County Line Road
- the horse/foot trail around Keene Quarry
- Cave Quarry, in its entirety
- the historic stone bridge area
- the amphitheater quarry parking lot
- the access road to PennDOT Quarry
- the access road to Keene Quarry
- Maintenance Quarry #1 in its entirety
- the soil/gravel staging area around Maintenance Quarry #2

A soil sampling plan should be developed in order to specify the method of sample collection, personal protective equipment required, analytical methods, number of samples, and specific sample locations.

#### 4.5 Air Sampling

Air sampling will be conducted on NPS employees who engage in activities in or around areas identified with exposed asbestos. In particular, NPS employees who operate grass mowing equipment around areas identified with previously exposed asbestos will wear personal air samplers affixed with 25mm cellulose cartridges during these operations. The air samplers will be calibrated in accordance with the air sampling plan and will draw 2 liters of air per minute for the duration of the activities. These samples will be analyzed for asbestos via NIOSH Method 7402, Transmission Electron Microscopy (TEM), for asbestos.

Because the employees will be conducting routine operations while being sampled, the level of protection required for this sampling will be level "D".

## 5.0 SATA OBSERVATIONS

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SATA has conducted a rudimentary aerial photographic interpretation utilizing a 1948 and a 1950 aerial photograph. The areas which have been identified as anomalous have been depicted on the Site map. SATA completed intensive ground surveys of all of these anomalous areas in June 1997. Priority areas of suspected exposed asbestos were treated with soil stabilizer by an ERCS subcontractor later that month. During the field ground survey, SATA noted several areas of potential concern. These observations are included here for future reference.

Maintenance Quarry #1 was in relatively good shape. The cover in this area appeared to be adequate, with the exception of two small areas located by NPS representatives. These two areas are located approximately midway between the maintenance buildings and the west wall of the quarry along the base of its south wall (#1A). These areas were determined to have resulted from subsidence of the overlying cover. Area #1A was not sampled for asbestos analysis. Another area (#1B) located along the north wall of the quarry was sampled by NPS with analytical results being negative for asbestos.

Maintenance Quarry #2 is heavily vegetated. Three areas of exposed asbestos were sampled and confirmed within this quarry, two of which lie at the base of its west wall (#2A and 2B) and one of which lies approximately 125 feet to the east of these areas (#2C). The latter area resulted from the subsidence of a small portion (approximately 10 feet X 10 feet) of the quarry floor. This subsidence confirmed a vegetated soil cover of approximately 3 feet in the quarry floor with asbestos-containing material underlying this cover. Several other areas of subsidence were noted; however, no additional suspected ACM was located in this quarry. As a result of the heavy vegetation, it was determined that an intensive field ground survey should be conducted in this quarry during winter months when vegetative cover is at a minimum. This area was not treated, and therefore access should be restricted until a remediation option is selected.

Maintenance Quarries #3 and #4 appear to have adequate soil and vegetative cover. No areas of suspected exposed asbestos were located in either of these quarries. An area of exposed white material was located approximately 150 feet to the south of Maintenance Quarry #4 near a field (#15A). This area totals approximately 200 square feet and was sampled for asbestos analysis. A remediation option should be selected for this area upon receipt of analytical results.

A small area was identified on the 1950 aerial photograph near the maintenance building. This area now appears to be located under the employee parking lot, and therefore was determined to be adequately covered.



Within the Keene Quarry, there are four areas of concern. SATA completed an intensive field ground survey of the entire Keene Quarry in June 1997. The first area of concern lies along the railbed extending from County Line Road approximately 300 feet into the quarry (#7). Exposed areas along this railbed were remediated by the ERCS contractor or provided with a sprinkler system by the EPA in May and June 1997; however, it appears that the soil cover within the entire railbed is inadequate. This area will require a subsurface investigation to determine the depth of cover. This area should be given high priority.

The second area within Keene Quarry lies to the northeast of the quarry access road, approximately 300 feet from County Line Road and approximately 30 feet from the access road. This area was identified as exposed suspected asbestos as a result of a fallen tree's root ball (#5A) and was stabilized with soil stabilizer. The cover in this area appeared to be approximately 12 inches. This area should be targeted for subsurface investigation and should be given medium priority.

The third area within Keene Quarry is along the steep embankment in the west end of the quarry (#5B and 5C). Animal activity and heavy erosion in this area have exposed significant amounts of asbestos. This area was remediated by the ERCS subcontractor utilizing soil stabilizer in June 1997; however, additional exposure is certain to occur in the near future. This area should be given high priority for remediation because of this potential exposure and the volume of visitor traffic on foot and horseback normally seen in this area.

The fourth area within Keene quarry extends westward from the steep embankment to the wood line behind the small gravel parking lot along County Line Road (#5D). During the SATA field ground survey, it was noted that the soil cover appeared to be inadequate in large portions of this area. Several animal holes were located by SATA along County Line Road which had exposed suspected asbestos and were stabilized with soil stabilizer by the ERCS contractor. This area was heavily vegetated in many portions, and therefore an intensive field ground survey could not be completed. Such a survey should be conducted in this area during the winter months when vegetation is at a minimum. This area should be given high priority for field survey, subsurface investigation, and remediation because of the horse and visitor traffic.

The remainder of Keene Quarry appeared to have adequate cover and was thoroughly investigated.

The old railbed which runs along County Line Road near the Silicate Banks leading from Keene quarry has been remediated with soil capping, stabilization, or has been provided with a sprinkler system by the EPA. The silicate banks along this area have been stabilized (#8), and therefore a long term solution will be required. This area still poses a threat of continued exposure as a result of erosion and deer activities, and therefore should be inspected periodically. The silicate banks should be given high

priority for remediation because of their proximity to County Line Road. A covered berm of confirmed asbestos runs along the railbed at the base of the silicate banks. The cover on this berm is suspect, and therefore should be remediated and given high priority. The railroad bank cut along this area on the opposite side of the Silicate Banks was sampled and is confirmed to contain asbestos. A sprinkler system has been provided for this areas by the EPA, however, remediation is required. The grassy area which extends from County Line Road to the silicate banks appeared to be underlaid by suspected ACM, from review of the 1950 aerial photograph. This area will require subsurface investigation in order to determine the depth of vegetated soil cover. Because of the proximity to County Line Road, this area should be given high priority.

The Grassy Knoll area to the north of County Line Road across from the silicate banks appeared to have inadequate cover. Several areas were noted where soil cover was thin (#9A and 9B), and several were noted where erosion has exposed suspected ACM (#9C). These areas were stabilized or provided with a sprinkler system. Although this area is vegetated very well with tall grass, the cover appears to be inadequate. This area will require subsurface investigation and should be given high priority because of its proximity to County Line Road.

The small PennDOT Quarry was thoroughly investigated. The majority of this quarry is covered with asphalt and gravel and appears to be in good condition. A small area was noted by SATA on the south wall of the quarry, approximately 100 feet from the dirt road (#13). This area was sampled, and was negative for asbestos.

A thorough field investigation was conducted in the ampitheater quarry. The parking lot area of the quarry appears to have adequate cover. On the west wall of the quarry, a significant amount of exposed asbestos was confirmed (#6A and 6B). All of these areas were stabilized; however, a long term solution will be required. Areas of exposed asbestos were also located over the small embankment on the north wall of the quarry, which were provided with a sprinkler system (#6C). These areas will require permanent remediation and should be given medium priority since they are isolated from visitor traffic.

The area around the historic stone bridge has been investigated and exposed areas have been stabilized. This area consisted of an exposed silicate bank (#14A) as well as mounds of exposed fibrous asbestos (#14B), totaling approximately 800 square feet. No additional suspect areas were located. The areas around the exposed materials appear to have adequate cover.

SATA completed an intensive field investigation of the horse trail/railbed which extends from the lower visitors center parking lot to the ampitheater. The berm of covered asbestos which originates near the silicate banks along County Line Road (area #8) continues through this area. Although all exposed areas have been capped or stabilized, this berm appears to have inadequate cover and should be given medium to

high priority for permanent remediation (#10A and 10B). This berm is subject to erosion and deer traffic, and therefore should be targeted for subsurface investigation as well as periodic monitoring.

The Cave Quarry appears to have adequate cover throughout. The area around the cave within the quarry should be subjected to a subsurface investigation and should be given high priority because of the visitor traffic to that area (#12A). The remainder of the quarry should be given medium priority for subsurface investigation (#12B, 12C, 12D). Areas of exposed asbestos within the quarry have been provided with a sprinkler system.

The ditch along County Line Road was investigated extensively by SATA. The exposed asbestos areas identified by NPS were the only areas of exposed asbestos located within the ditch (#11). This ditch should be targeted for subsurface investigation and should be given high priority because of its proximity to County Line Road. Approximately 235 square feet of exposed ACM was treated with soil stabilizer in this area.

A small quarry was identified on the 1948 and 1950 aerial photographs which indicated the presence of a white substance (#16). This area was thoroughly investigated by SATA, and two small groundhog holes were identified with suspected ACM. This area was provided with a sprinkler system by the EPA, but will require soil capping or a more permanent solution.

Area #17 consists of the small creek which flows under the Conrail tracks and into the Schuylkill River, including a bank at the convergence of two creeks on the south side of the Conrail tracks and a horse trail crossing over the creek on the north side of the Conrail tracks. Suspected ACM was sampled by SATA at the convergence bank, the horse trail crossing, and the effluent alluvial fan at the Schuylkill River. NPS representatives erected high visibility snow fencing to restrict access to these areas. All of the samples collected in this area were positive for asbestos and a remediation option should be selected for this area. A thorough subsurface investigation of the area around this creek should be conducted to determine the extent of ACM buried in this flood plain.

## 6.0 CONCLUSION

This extent of contamination study plan is designed to provide the most complete assessment of the total area of asbestos contamination at the Valley Forge National Historical Park with the available data. As additional information becomes available, this plan will require modifications in order to maintain its objectives. As a result of the method and duration of ACM disposal at the Site since the late 1800's, the procedures specified in this plan cannot be expected to locate every potential area of

asbestos contamination, and therefore a continued effort will be required at the VFNHP to locate new areas of suspected contamination. Park Rangers and NPS employees should consider the potential presence of ACM in and around the quarry areas and should notify the VFNHP Safety Officer if such materials are located during routine activities at the Park. In addition, interviews should be conducted with former employees of the Keene Corporation in order to further evaluate the extent of contamination at the Site.

- Attachment - 1) Site Map  
2) Appendix A  
3) Appendix B

## APPENDIX A

### PROPOSED SHORT- AND LONG-TERM SOLUTIONS FOR IDENTIFIED AREAS

Areas on-site which have been identified as containing suspect or confirmed ACM have been named by the OSC, NPS, ERCS RM, and SATA. These areas are identified according to geographical/landmark features and have been numbered (see site map). The major areas, along with their associated sub-areas, and current status, are identified in the following list. A potential short term solution (ST) and a potential long term solution (LT) are included for each sub area. Appendix B provides more detailed information for each area.

- 1) Maintenance Quarry #1
  - A) south wall - ACM soil capped and vegetated.  
ST = area completed with 6" vegetated soil cap  
LT = maintain 6" vegetated cover.
  - B) north wall - negative for asbestos  
No action required.
- 2) Maintenance Quarry #2
  - A) west wall, south spot - exposed ACM  
ST = area stabilized.  
LT = 6" vegetated soil cap.
  - B) west wall, north spot - exposed ACM  
ST = area stabilized.  
LT = 6" vegetated soil cap.
  - C) subsidence area near north and south spots - exposed ACM  
ST = area stabilized.  
LT = 6" vegetated soil cap.
- 3) Maintenance Quarry #3  
Ground survey complete, no areas identified  
No action required.
- 4) Maintenance Quarry #4  
Ground survey complete, no areas identified  
No action required.
- 5) Keene Quarry
  - A) root ball exposure area - suspect ACM  
ST = area stabilized.  
LT = 6" vegetated soil cap.
  - B) west embankment - exposed ACM  
ST = area stabilized.  
LT = engineered vegetated soil cover system.
  - C) groundhog hole, north bank - exposed ACM  
ST = area stabilized.  
LT = 6" vegetated soil cap.

- D) area along County Line Road west of west embankment - exposed suspect ACM  
ST = area stabilized.  
LT = 6" vegetated soil cap.
- 6) Ampitheater Quarry  
A) west wall overhang - exposed ACM  
ST = area stabilized.  
LT = remove, transport, and dispose.  
B) west wall base - exposed ACM  
ST = area stabilized.  
LT = 6" vegetated soil cover.  
C) remote sensor area - suspect ACM  
ST = area stabilized.  
LT = 6" vegetated soil cover.
- 7) Railbed from County Line Road to Keene Quarry - exposed ACM  
ST = area capped with 6" vegetated soil or provided with sprinkler system  
LT = 12" soil cap.
- 8) Silicate Banks along County Line Road  
A) Silicate Banks - exposed ACM  
ST = area stabilized.  
LT = engineered soil covering system.  
B) Railbed cutout - exposed ACM  
ST - area provided with sprinkler system  
LT - engineered soil covering system
- 9) Grassy Knoll area  
A) north mound - no areas identified  
No action.  
B) east mound - exposed ACM  
ST = area provided with a sprinkler system.  
LT = 6" vegetated soil cap.  
C) drainage area between mounds - exposed ACM  
ST = area stabilized.  
LT = 6" vegetated soil cap with integrated drainage culvert system.
- 10) Lower Visitors Center Parking Lot to Ampitheater Trail  
A) drainage ditch - exposed ACM  
ST = area stabilized.  
LT = install 100 year flood drainage culvert and cover with soil.  
B) horse trail exposed spots - exposed ACM  
ST = provided with a sprinkler system  
LT = 6" vegetated soil cap.
- 11) Drainage Ditch along County Line Road - exposed ACM  
ST = area stabilized.  
LT = install 100 year flood drainage culvert and cover with soil.
- 12) Cave Quarry

- A) north wall exposed spots - exposed suspect ACM  
ST = area provided with a sprinkler system  
LT = 6" vegetated soil cover.
  - B) east wall exposed spots - exposed suspect ACM  
ST = area provided with a sprinkler system  
LT = 6" vegetated soil cover.
  - C) south wall exposed spots - exposed suspect ACM  
ST = area provided with a sprinkler system  
LT = 6" vegetated soil cover.
  - D) west wall exposed spots - exposed suspect ACM  
ST = area provided with a sprinkler system  
LT = 6" vegetated soil cover.
- 13) PennDOT Quarry exposed spot, south wall.  
Analytical results were negative for asbestos. No action.
- 14) Historic Stone Bridge Area
- A) silicate bank - exposed ACM  
ST = area stabilized.  
LT = engineered soil cover system.
  - B) asbestos mounds from amp quarry - exposed ACM  
ST = area stabilized or provided with a sprinkler system  
LT = 12" soil cap.
- 15) Maintenance Area
- A) north spot  
Analytical results were negative for asbestos. No action.
- 16) Area across from LVC parking lot midway exit - exposed suspect ACM  
ST = area provided with a sprinkler system.  
LT = 12 " soil cap.
- 17) Horse trail at point of discharge into Schuylkill River - exposed ACM  
ST = restrict access.  
LT = install 100 year flood drainage culvert and cover with soil

## **APPENDIX B**



## VALLEY FORGE NHP ASBESTOS AREAS - SQUARE FOOTAGE

Area ID	Area Name	Total Sq. ft. Exposed	Sq. ft. Soil Capped	Sq. ft. Stabilized	Remaining Sq. ft. Exposed	Comments	Confirmed Stabilizer	Asbestos Soil Cover	Samples	
1A	Maintenance Quarry 1 south wall	100.00	100.00		0.00				No	
1B	Maintenance Quarry 1 north wall	0.00			0.00				Negative	
2A	Maintenance Quarry 2 west wall south	144.00		144.00	0.00	*			Positive	
2B	Maintenance Quarry 2 west wall north	126.00		126.00	0.00	*			Positive	
2C	Maintenance Quarry 2 subsidence	90.00		90.00	0.00	*			Positive	
3	Maintenance Quarry 3	0.00			0.00				NA	
4	Maintenance Quarry 4	0.00			0.00				NA	
5A	Keene Quarry root ball	98.00		98.00	0.00	*			No	
5B	Keene Quarry west embankment	2,788.25		2,788.25	0.00	*			Positive	
5C	Keene Quarry groundhog hole	100.00		100.00	0.00	*!			No	
5D	Keene Quarry CL road west bank	961.00		961.00	0.00	*			No	
6A	Amp Quarry overhang	139.00		139.00	0.00	*			Positive	
6B	Amp Quarry west wall base	6,723.75	5,000.00	1,723.75	0.00	*			Positive	
6C	Amp Quarry remote sensor	48.00		48.00	0.00	*			No	
7	Railbed from CL to Keene Quarry	14,450.00	3,450.00		11,000.00	*!#		11,000.00	Positive	
8A	Silicate Banks	11,723.30		11,723.30	0.00	*			Positive	
8B	Railbed cutout near Silicate bank	10,586.00	746.00		9,840.00	*!#		9,840.00	Positive	
9B	Grassy Knoll East Mound	350.00			350.00	!#		350.00	No	
9C	Grassy Knoll drainage	663.25	400.00	263.25	0.00	*			Positive	
10A	LVC Park Lot to Amp drainage	109.75		109.75	0.00	*			Positive	
10B	LVC Park Lot to Amp horse trail	4,350.00	3,750.00		600.00	!#		600.00	Positive	
11	CL Road drainage ditch	314.00		314.00	0.00	*			Positive	
12A	Cave Quarry north	3,500.00	3,200.00		300.00	!#		300.00	Positive	
12B	Cave Quarry east	810.00	570.00		240.00	!#		240.00	Positive	
12C	Cave Quarry south	772.00	572.00		200.00	!#		200.00	Positive	
12D	Cave Quarry west	672.00	572.00		100.00	!#		100.00	Positive	
13	PennDOT Quarry	0.00			0.00	*			Negative	
14A	Historic Bridge Silicate Bank	1,210.00		1,210.00	0.00	*			Positive	
14B	Historic Bridge mounds	1,000.00		246.00	754.00	*!#@		754.00	Positive	
15A	Maintenance Area north	0.00		620.00	0.00	*			Negative	
16	Area across from LVC Park lot	200.00			200.00	!#		200.00	No	
17	POD Horse trail	400.00			400.00	*#@			Positive	
	TOTALS	62,478.30	18,360.00	20,704.30	24,034.00			23,584.00		
	GRAND TOTALS									
	! = area that could be remediated with soil.									
	* = measured and confirmed by EPA or NPS.									
	# = NPS to cover with soil/maintain wet.									
	@ = special considerations:	754 sq. ft. of 14B is historic structure				754				
		400 sq. ft. of 17 is creek				400				